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MONTANA POPULATION PROJECTIONS, 1980-2000
(SUMMARY)

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Research and Information Systems Division
Department of Community Affairs
Helena, Montana

July 1978

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Introduction

This document is a summary of a more extensive document, Montana Population Projections, 1980-2000 for Counties and Incorporated Cities and Towns prepared by the Research and Information Systems Division, Department of Community Affairs for the Water Quality Bureau of the Montana Department of Health and Environmental Sciences. This summary first briefly discusses the methodology used to produce the county projections, followed by the actual projections. The procedures and projections of population for cities and towns are then outlined.

Methodology *

The methodology used to project population by county in Montana is a computerized economic-demographic model called the Montana Alternative Simulation System (MASS). The main goal of the system is to produce a consistent set of county level employment and population projections, as well as to provide a general framework for evaluating the impacts of industrial developments. MASS combines trend, economic base analysis and a population cohort-survival process into a complementary whole, thus avoiding the divergent forecasts of employment and population that commonly result from independent forecasting methods. The principal advantage of MASS lies in its ability to produce at relatively low cost, in both time and resources, projections of population and the impact of economic events. However, as with any model or information source, the outputs of MASS must be considered only a part of the analysis rather than an end product.

The first step in the construction of MASS was the formulation of the natural increase demographic model (cohort model). This model used age-specific Montana birth information, adjusted projected national survival rates by age and sex, adjusted labor force participation rates (percent of a population group in the labor force) and employment-to-labor force ratios to project natural increase population and employment to the year 2000. This natural increase projection is an estimate reflecting no net migration. The analysis included special computational procedures for Indian, military and college student subpopulations.

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* This section draws heavily on a previously published document, "Montana Alternative Simulation System", by Bruce Finnie, Research and Information Systems Division, Department of Community Affairs, Helena, Montana, March, 1977.

The next step was the classification of employment sectors into two groups: basic and non-basic. Basic industries are those whose employment levels are determined by factors outside the area of interest; in this case, the specific Montana county. Examples include agriculture and metal mining. Basic sectors also directly or indirectly export products outside the area being studied and, hence, bring income into the region. On the other hand, non-basic industries such as the local government sector serve local needs. In addition, many sectors represent a mixture of basic and non-basic activity. All sectors for Montana counties were categorized as basic, non-basic, or some combination of the two. Every available information source was used in this process.

Once the basic sectors were identified, projections of basic employment levels by sector and county were made. These projections were principally time trends adjusted using documented planned employment expansions and contractions and other information concerning the growth of a county's basic industries. Basic employment projections drive the entire MASS system.

The next step involved computing the ratios of non-basic-to-basic employment in each county for the period of 1970-1975. Data from this period, as well as other time periods and areas, indicate that these ratios of multipliers vary significantly over time and generally increase.

There are several factors behind this increase. First, personal income has increased, both in Montana and nationally, causing the demand for products of non-basic sectors to increase. Public and private services are more and more substituted for activities once provided in the home. At the same time, the supply of workers available for non-basic type jobs has increased as the "baby boom" babies reached employment age, and because of the increasing tendency of women to participate in the labor force outside the home.

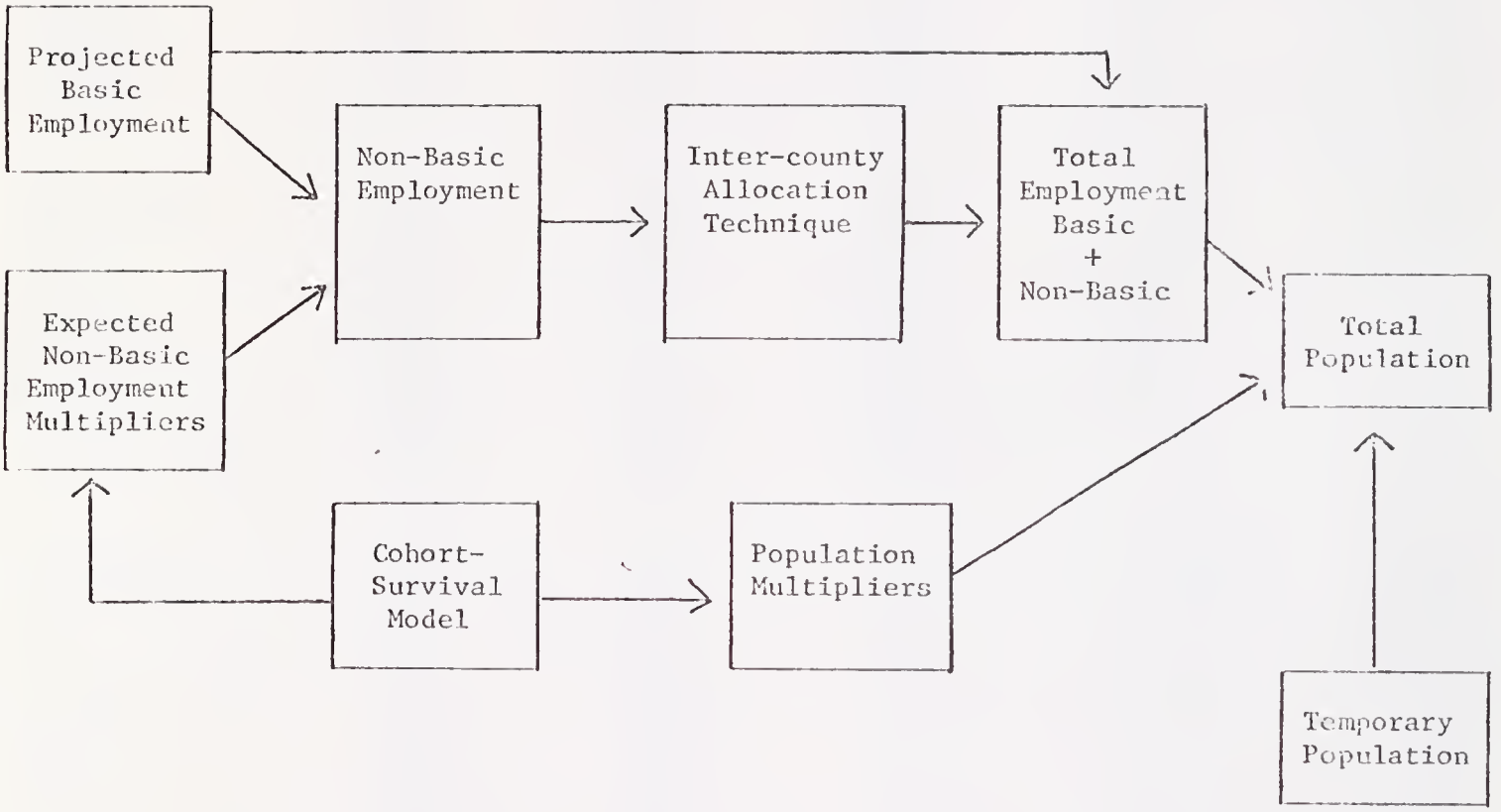
The above factors were incorporated into the procedure for projecting a statewide non-basic-to-basic ratio. This ratio was calculated as a function of the weighted average of projected age-sex specific labor force participation rates, using the estimated natural increase population of the cohort model by age and sex as weights. Changes in the state multiplier were assumed to hold at the county level and were used to adjust the county ratios over time.

Non-basic employment by county was estimated by applying non-basic multipliers to county level basic employment projections. As part of this process, a mathematical programming-gravity model was used to quantify inter-county linkages between basic and non-basic employment. This resulted in a county percentage distribution or allocation of non-basic employment related to basic employment in a given county. The allocation technique was confined to two of five broadly-defined types of non-basic sectors.

The next major link in the system required the development of a set of projected population multipliers. These population-to-employment ratios were derived from the cohort model and 1975 county employment and population data. These multipliers change over time for the same reasons which contributed to the general growth in non-basic/basic ratios.

The estimated population multipliers were applied to projected total employment (basic and non-basic) to derive projections of population by county. These were then adjusted for population levels associated with major temporary construction projects and for non-employment related population growth.

The overall structure of the MASS model is summarized in the following diagram:


Projected Basic Employment
Non-Basic Employment
Inter-county Allocation Technique
Total Employment Basic + Non-Basic
Total Population
Expected Non-Basic Employment Multipliers
Cohort-Survival Model
Population Multipliers
Temporary Population

County Projections

Population projections for the period 1980-2000 produced by the MASS model are presented in the following table. A survey of the table indicates that Montana's more urban counties* accounted for almost 90 percent of the population growth. Most of the small counties (population under 7500) were projected to have declining population. A majority of the remaining medium-sized counties (up to 40,000 population) displayed moderate growth over the projection period.

* Cascade, Flathead, Gallatin, Lewis and Clark, Missoula, Silver Bow, and Yellowstone counties.

MONTANA COUNTY POPULATION PROJECTIONS: 1980 - 2000
(rounded to nearest 100)

COUNTY	1980	1985	1990	1995	2000
Beaverhead	8,200	8,200	8,200	8,200	8,300
Big Horn *	11,400	12,400	13,400	13,900	14,900
Blaine	6,700	6,600	6,500	6,500	6,400
Broadwater	3,100	3,100	3,100	3,100	3,100
Carbon	8,900	9,200	9,700	10,200	11,000
Carter	1,800	1,800	1,700	1,600	1,500
Cascade	85,600	89,000	93,000	97,300	101,400
Chouteau	6,300	6,200	6,100	5,900	5,800
Custer	13,100	13,400	13,500	13,700	13,900
Daniels	3,100	2,900	3,700	3,600	3,400
Dawson	11,200	11,200	11,200	11,400	11,600
Deer Lodge	13,500	13,300	13,000	12,700	12,400
Fallon	4,100	4,100	4,100	4,100	4,100
Fergus	13,300	13,300	13,300	13,400	13,600
Flathead	48,900	52,500	55,600	58,600	62,100
Gallatin	40,200	43,700	46,300	48,900	51,700
Garfield	1,800	1,800	1,800	1,700	1,600
Glacier	11,200	11,300	11,600	11,900	12,100
Golden Valley	1,000	1,000	900	900	900
Granite	2,700	2,800	2,800	2,800	2,800
Hill	18,200	18,700	19,200	19,800	20,300
Jefferson	7,300	8,000	8,200	9,400	10,200
Judith Basin	2,700	2,600	2,400	2,300	2,200
Lake	18,000	18,500	18,900	19,400	20,000
Lewis & Clark	40,900	44,900	48,800	52,800	57,500
Liberty	2,500	2,400	2,300	2,300	2,200
Lincoln *	17,900	18,100	18,300	18,600	17,500
McCone	2,600	2,600	2,500	2,400	2,300
Madison	5,700	5,800	5,800	5,700	5,700
Meagher	2,300	2,300	2,300	2,300	2,300
Mineral	3,700	3,800	3,900	4,000	4,100
Missoula	69,500	74,100	78,300	83,600	89,000
Musselshell	4,400	4,600	4,600	4,600	4,600
Park	12,800	13,100	13,500	13,800	14,200
Petroleum	700	600	600	500	500
Phillips	5,500	5,300	5,200	5,200	5,100
Pondera	7,100	7,000	6,800	6,700	6,600
Powder River	2,600	2,600	2,600	2,600	2,600
Powell	8,000	8,200	8,300	8,500	8,600
Prairie	1,800	1,800	1,700	1,700	1,600

MONTANA COUNTY POPULATION PROJECTIONS: 1980 - 2000
(rounded to nearest 100)

COUNTY	1980	1985	1990	1995	2000
Ravalli	20,500	21,400	22,700	23,800	25,000
Richland	10,400	10,300	10,200	10,100	10,000
Roosevelt	10,700	10,900	11,100	11,300	11,500
Rosebud	10,100	11,100	11,100	11,200	11,300
Sanders	8,600	8,700	8,900	9,200	9,400
Sheridan	5,400	5,200	5,200	5,100	5,000
Silver Bow	40,900	40,700	40,500	40,500	40,500
Stillwater *	5,500	5,400	6,800	6,500	6,200
Sweet Grass *	3,300	3,200	3,700	3,700	3,600
Teton	6,300	6,300	6,200	6,100	6,100
Toole	5,300	5,400	5,400	5,500	5,500
Treasure	1,200	1,100	1,000	900	800
Valley	13,300	13,100	13,000	12,900	12,900
Wheatland	2,500	2,500	2,500	2,400	2,400
Wibaux	1,500	1,500	1,500	1,400	1,300
Yellowstone	109,700	123,500	136,400	150,000	164,400
TOTAL	785,500	823,100	859,900	897,200	935,600

SOURCE: Derived

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* Total population includes temporary construction workers and families. Population without this component is as follows: Big Horn - 11,100 (1980), 12,200 (1985), 13,200 (1990); Lincoln - 16,500 (1980); Stillwater - 5,200 (1985); and Sweet Grass - 3,100 (1985).

Incorporated City and Town Projections

This section contains population projections for incorporated Montana cities and towns for the period 1980 to 2000. The basic method used was to start with county projections and then allocate these to cities and towns based on an estimated share that their populations bear to that of the county. For purposes of this exercise, share coefficients were assumed constant over the projection period. They were chosen from the following set of five possible values:

1. The trended city's share using data for 1950, 1960, 1970, and 1975 or 1976 (The trend was usually linear.)
2. The average of the 1960 and 1970 shares
3. The 1970 share coefficient
4. The 1975 share
5. The 1976 percentage

For each city or town, the particular coefficient was chosen on the basis of the reasonableness of the 1980 projection, using the coefficient, compared with its 1976 population estimate computed by the U. S. Bureau of the Census (unpublished preliminary data). In some cases, this percentage was modified based on additional factors.

Population projections, which are fraught with risk at best, become even more precarious in the case of cities and towns, and those presented in the following table should be used with caution for a couple of reasons. First, it is impossible to predict what areas will be annexed by a given city or town, and yet annexation could substantially alter its future reported population level. Also, mistakes in county projections are reflected in city forecasts as a result of using share coefficients, unless compensating errors occur.

INCORPORATED CITY AND TOWN PROJECTIONS: 1980-2000*

	1980	1985	1990	1995	2000
BEAVERHEAD COUNTY	8,200	8,200	8,200	8,200	8,300
Dillon	4,600	4,600	4,600	4,600	4,650
Lima	350	350	350	350	350
BIG HORN COUNTY**	11,400	12,400	13,400	13,900	14,900
Hardin**	3,150	3,400	3,700	3,800	4,100
Lodge Grass	900	1,000	1,050	1,100	1,200
BLAINE COUNTY	6,700	6,600	6,500	6,500	6,400
Chinook	1,800	1,800	1,750	1,750	1,750
Harlem	1,150	1,150	1,100	1,100	1,100
BROADWATER COUNTY	3,100	3,100	3,100	3,100	3,100
Townsend	1,700	1,700	1,700	1,700	1,700
CARBON COUNTY	8,900	9,200	9,700	10,200	11,000
Bearcreek	50	50	50	50	50
Bridger	1,100	1,100	1,200	1,250	1,350
Fromberg	450	450	500	500	550
Joliet	550	600	600	650	700
Red Lodge	2,500	2,600	2,750	2,850	3,100
CARTER COUNTY	1,800	1,800	1,700	1,600	1,500
Ekalaka	600	600	600	550	500
CASCADE COUNTY	85,600	89,000	93,000	97,300	101,400
Belt	700	700	750	800	800
Cascade	700	750	800	800	850
Great Falls	62,500	65,100	67,900	71,050	74,050
Neihart	100	100	100	100	100
CHOUTEAU COUNTY	6,300	6,200	6,100	5,900	5,800
Big Sandy	800	800	800	750	750
Fort Benton	1,850	1,800	1,800	1,700	1,700
Geraldine	350	350	350	350	350
CUSTER COUNTY	13,100	13,400	13,500	13,700	13,900
Ismay	50	50	50	50	50
Miles City	9,700	9,950	10,000	10,150	10,300

INCORPORATED CITY AND TOWN PROJECTIONS: 1980-2000

	1980	1985	1990	1995	2000
DANIELS COUNTY	3,100	2,900	3,700	3,600	3,400
Flaxville	200	200	250	200	200
Scobey	1,550	1,450	2,250	2,200	2,100
DAWSON COUNTY	11,200	11,200	11,200	11,400	11,600
Glendive	6,150	6,150	6,150	6,250	6,400
Richey	400	400	350	350	350
DEER LODGE COUNTY	13,500	13,300	13,000	12,700	12,400
Anaconda	8,550	8,450	8,250	8,050	7,850
FALLON COUNTY	4,100	4,100	4,100	4,100	4,100
Baker	2,650	2,650	2,650	2,650	2,650
Plevna	200	200	200	200	200
FERGUS COUNTY	13,300	13,300	13,300	13,400	13,600
Denton	400	400	400	400	400
Grass Range	200	200	200	200	200
Lewistown	6,800	6,800	6,800	6,850	6,950
Moore	200	200	200	200	200
Winifred	200	200	200	200	200
FLATHEAD COUNTY	48,900	52,500	55,600	58,600	62,100
Columbia Falls	3,300	3,500	3,750	3,900	4,150
Kalispell	16,150	17,350	18,350	19,350	20,500
Whitefish	3,900	4,200	4,450	4,700	4,950
GALLATIN COUNTY	40,200	43,700	46,300	48,900	51,700
Belgrade	1,950	2,150	2,250	2,400	2,550
Bozeman	21,300	23,150	24,550	25,900	27,400
Manhattan	950	1,050	1,100	1,150	1,250
Three Forks	1,450	1,550	1,650	1,750	1,850
West Yellowstone	800	850	950	1,000	1,050
GARFIELD COUNTY	1,800	1,800	1,800	1,700	1,600
Jordan	550	550	550	500	450

INCORPORATED CITY AND TOWN PROJECTIONS: 1980-2000

	1980	1985	1990	1995	2000
GLACIER COUNTY	11,200	11,300	11,600	11,900	12,100
Browning	1,800	1,800	1,850	1,900	1,950
Cut Bank	3,900	3,950	4,050	4,150	4,200
GOLDEN VALLEY	1,000	1,000	900	900	900
Lavina	200	200	150	150	150
Ryegate	300	300	250	250	250
GRANITE COUNTY	2,700	2,800	2,800	2,800	2,800
Drummond	500	500	500	500	500
Philipsburg	1,000	1,000	1,000	1,000	1,000
HILL COUNTY	18,200	18,700	19,200	19,800	20,300
Havre	11,100	11,400	11,750	12,100	12,400
Hingham	250	300	300	300	300
JEFFERSON COUNTY	7,300	8,000	8,200	9,400	10,200
Boulder	1,100	1,100	1,100	1,100	1,100
Whitehall	1,450	1,500	1,550	1,750	1,850
JUDITH BASIN COUNTY	2,700	2,600	2,400	2,300	2,200
Hobson	200	200	200	150	150
Stanford	500	500	450	450	400
LAKE COUNTY	18,000	18,500	18,900	19,400	20,000
Polson	3,000	3,100	3,150	3,250	3,350
Ronan	1,500	1,550	1,550	1,600	1,650
St. Ignatius	900	900	900	900	900
LEWIS & CLARK COUNTY	40,900	44,900	48,800	52,800	57,500
East Helena	2,050	2,250	2,400	2,600	2,850
Helena	27,500	30,200	32,800	35,500	38,650
LIBERTY COUNTY	2,500	2,400	2,300	2,300	2,200
Chester	1,000	950	900	900	850

INCORPORATED CITY AND TOWN PROJECTIONS: 1980-2000

	1980	1985	1990	1995	2000
LINCOLN COUNTY**	17,900	18,100	18,300	18,600	17,500
Eureka	1,050	1,100	1,100	1,100	1,100
Libby**	3,250	3,300	3,350	3,400	3,200
Rexford	150	150	150	150	150
Troy**	1,100	1,100	1,100	1,150	1,050
McCONE COUNTY	2,600	2,600	2,500	2,400	2,300
Circle	1,050	1,050	1,050	1,000	950
MADISON COUNTY	5,700	5,800	5,800	5,700	5,700
Ennis	550	600	600	550	550
Sheridan	750	750	750	750	750
Twin Bridges	750	750	750	750	750
Virginia City	200	200	200	200	200
MEAGHER COUNTY	2,300	2,300	2,300	2,300	2,300
White Sulphur Springs	1,400	1,400	1,400	1,400	1,400
MINERAL COUNTY	3,700	3,800	3,900	4,000	4,100
Alberton	500	500	550	550	550
Superior	1,100	1,100	1,150	1,150	1,200
MISSOULA COUNTY	69,500	74,100	78,300	83,600	89,000
Missoula	31,300	33,300	35,250	37,600	40,050
MUSSELSHELL COUNTY	4,400	4,600	4,600	4,600	4,600
Melstone	250	250	250	250	250
Roundup	2,400	2,500	2,500	2,500	2,500
PARK COUNTY	12,800	13,100	13,500	13,800	14,200
Clyde Park	300	300	300	300	350
Livingston	7,300	7,450	7,700	7,850	8,100
PETROLEUM COUNTY	700	600	600	500	500
Winnett	250	200	200	150	150

INCORPORATED CITY AND TOWN PROJECTIONS: 1980-2000

	1980	1985	1990	1995	2000
PHILLIPS COUNTY	5,500	5,300	5,200	5,200	5,100
Dodson	200	150	150	150	150
Malta	2,300	2,250	2,200	2,200	2,150
Saco	350	350	350	350	350
PONDERA COUNTY	7,100	7,000	6,800	6,700	6,600
Conrad	3,350	3,300	3,200	3,150	3,100
Valier	700	700	650	650	650
POWDER RIVER COUNTY	2,600	2,600	2,600	2,600	2,600
Broadus	750	750	750	750	750
POWELL COUNTY	8,000	8,200	8,300	8,500	8,600
Deer Lodge	5,150	5,300	5,350	5,500	5,550
PRAIRIE COUNTY	1,800	1,800	1,700	1,700	1,600
Terry	900	900	850	850	800
RAVALLI COUNTY	20,500	21,400	22,700	23,800	25,000
Darby	550	550	550	550	550
Hamilton	3,350	3,500	3,800	3,900	4,150
Stevensville	1,300	1,350	1,450	1,500	1,600
RICHLAND COUNTY	10,400	10,300	10,200	10,100	10,000
Fairview	1,000	950	950	900	900
Sidney	4,850	4,800	4,800	4,750	4,700
ROOSEVELT COUNTY	10,700	10,900	11,100	11,300	11,500
Bainville	200	200	200	200	200
Brockton	400	400	400	400	450
Culbertson	850	850	900	900	900
Froid	300	300	300	300	300
Poplar	1,450	1,450	1,500	1,550	1,550
Wolf Point	3,650	3,700	3,750	3,850	3,900
ROSEBUD COUNTY	10,100	11,100	11,100	11,200	11,300
Forsyth	2,100	2,350	2,350	2,350	2,350

INCORPORATED CITY AND TOWN PROJECTIONS: 1980-2000

	1980	1985	1990	1995	2000
SANDERS COUNTY	8,600	8,700	8,900	9,200	9,400
Hot Springs	700	750	750	750	800
Plains	1,200	1,250	1,250	1,300	1,350
Thompson Falls	1,550	1,600	1,650	1,700	1,700
SHERIDAN COUNTY	5,400	5,200	5,200	5,100	5,000
Medicine Lake	350	350	350	350	350
Outlook	100	100	100	100	100
Plentywood	2,300	2,200	2,200	2,150	2,150
Westby	250	250	250	250	250
SILVER BOW COUNTY	40,900	40,700	40,500	40,500	40,500
Butte	22,950	22,850	22,750	22,750	22,750
Walkerville	1,000	1,000	1,000	1,000	1,000
STILLWATER COUNTY**	5,500	5,400	6,800	6,500	6,200
Columbus	1,350	1,300	1,700	1,600	1,550
SWEET GRASS COUNTY**	3,300	3,200	3,700	3,700	3,600
Big Timber	1,850	1,750	2,100	2,100	2,050
TETON COUNTY	6,300	6,300	6,200	6,100	6,100
Choteau	1,650	1,650	1,650	1,600	1,600
Dutton	400	400	400	400	400
Fairfield	650	650	650	650	650
TOOLE COUNTY	5,300	5,400	5,400	5,500	5,500
Kevin	200	200	200	200	200
Shelby	2,900	2,950	2,950	3,000	3,000
Sunburst	550	550	550	550	550
TREASURE COUNTY	1,200	1,100	1,000	900	800
Hysham	600	550	500	450	400

INCORPORATED CITY AND TOWN PROJECTIONS: 1980-2000

	1980	1985	1990	1995	2000
VALLEY COUNTY	13,300	13,100	13,000	12,900	12,900
Glasgow	5,400	5,300	5,250	5,200	5,200
Nashua	600	600	600	600	600
Opheim	350	350	350	350	350
WHEATLAND COUNTY	2,500	2,500	2,500	2,400	2,400
Harlowton	1,350	1,350	1,350	1,300	1,300
Judith Gap	150	150	150	150	150
WIBAUX COUNTY	1,500	1,500	1,500	1,400	1,300
Wibaux	650	650	650	600	600
YELLOWSTONE COUNTY	109,700	123,500	136,400	150,000	164,400
Billings	77,350	87,050	96,150	105,750	115,900
Broadview	100	100	100	100	100
Laurel	7,300	8,200	9,050	9,950	10,900

SOURCE: Derived

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* City and town projections were rounded to the nearest 50, and county control totals to the nearest 100 to eliminate spurious accuracy.

** Total population for some years includes temporary construction workers and families.

Smead MFG.CO. HASTINGS MN - LOS ANGELES - CHICAGO
LOGAN OH - McGREGOR TX - LOCUST GROVE GA